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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/656,758 | 09/05/2003 | Heon Lee | 100200451-7 | 1108 |

7590 06/08/2004
HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P. O. Box 272400
Fort Collins, CO 80527-2400

| | |
|-----------|--------------|
| EXAMINER | |
| VU, DAVID | |
| ART UNIT | PAPER NUMBER |
| 2818 | |

DATE MAILED: 06/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/656,758

Applicant(s)

LEE ET AL.

Examiner

DAVID VU

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2004.
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-20 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 16-20 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 05 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group II (Claims 16-20) on 04/19/2004 is acknowledged.

In view of applicant's cancellation of all claims pertaining to non-elected invention Group I, the restriction requirement is deemed moot.

Claim Objections

2. Claim 16 is objected to because of the following informalities: claim 16, lines 4 and 7, delete "ansotropically" and insert --anisotropically-- in its place. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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3. Claims 16-19 are rejected under 35 U. S. C. 102(e) as being anticipated by Tuttle (US Pat. 6,413,788).

Regarding claim 16, Tuttle discloses a method of forming a shared global word line MRAM structure, comprising: etching a trench 38 in an oxide layer 36 formed over a substrate (col. 5, lines 14-16); depositing an first liner material 52 (col. 6, lines 63-66 and fig. 5A); anisotropically etching (Noting that Applicant Specification on page 16, lines 18-20 teaches anisotropic etching by reactive ion etching or ion milling) the deposited first liner material 52 (col. 7, lines 26-31) leaving the first liner material 52 on edges of the trench 38 (col. 7, lines 32-34 and fig. 5B); depositing an magnetic metal liner material 54 (col. 6, line 63 through col. 7, line 1); anisotropically etching the deposited magnetic metal liner material 54 (col. 7, lines 26-31) leaving the magnetic metal liner material 54 over the first liner material 52 on edges of the trench 38 (col. 7, lines 32-34 and fig. 5B); depositing a conductive layer 74 (col. 7, lines 45-46 and fig. 5C); and chemically, mechanically polishing the conductive layer 74 (col. 7, lines 47-54 and fig. 5D).

Regarding claim 17, Tuttle discloses the first liner material 52 is tantalum (col. 6, lines 65-66).

Regarding claim 18, Tuttle discloses the magnetic metal liner material 54 comprises at least one of Nickel, Cobalt and Iron (col. 6, line 66 through col. 7, line 1).

Regarding claim 19, Tuttle discloses the conductive layer 74 is Copper (col. 7, lines 45-46).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claim 20 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Tuttle (US Pat. 6,413,788) in view of Pan et al. (US Pat. 6,548,849, herein after Pan).

Tuttle discloses all claimed subject matter, but fails to disclose the conductive layer is deposited through chemical vapor deposition. However, Pan teaches the copper conductive layer is deposited through chemical vapor deposition (col. 4, lines 64-65 and fig. 18). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Tuttle by using chemical vapor deposition

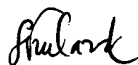
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as taught by Pan, the motivation being to obtain the advantage/benefit of providing improved uniformity of the deposited film.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (571) 272-1798. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm. If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David Vu

May 27, 2004